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Comparison of carotid intima media thicknesses of hypertension patients with normal coronary artery who are under effective antihypertensive therapy with the normal population

Muzaffer Bayhatun[1], Sadettin Selçuk Baysal[1], Ramazan Özdemir[2]

[1]Department of Cardiology, Başakşehir Çam ve Sakura City Hospital, İstanbul, Turkiye
[2]Department of Cardiology, Faculty of Medicine, İstanbul Bezmialem University, İstanbul, Turkiye

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Corresponding Author: Muzaffer Bayhatun, muzafferbayhatun@hotmail.com

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ABSTRACT

Aims: In this study, we aimed to compare the carotid intima media thickness in patients with treatment-regulated hypertension without coronary artery disease with the normal population.

Methods: A total of 62 patients with normal coronary arteries detected after elective coronary angiography; 32 patients without hypertension and 30 patients with hypertension regulated by drug therapy were enrolled in the study.

Results: In this study we conducted in our clinic, no statistically significant difference was found between carotid intima media thickness in the group whose hypertension was regulated by treatment, and in the control group.

Conclusion: The fact that the carotid intima media thicknesses of patients with treatment-regulated hypertension without coronary artery disease were not found to be different compared to the healthy patient group suggests to us that effective antihypertensive therapy may slow down the atherosclerotic process.

Keywords: Carotid intima media thickness, hypertension, normal coronary artery

INTRODUCTION

Hypertension is an important public health problem in all over the world, and it is thought that there are approximately 1 billion hypertension patients worldwide. Hypertension is a common risk factor for coronary and carotid atherosclerosis.[1,2] Intima media thickness, expressed as arterial wall thickness, has been shown to be an early marker of endothelial organ damage and an initial sign of atherosclerotic disease. Increased carotid intima media thickness (CIMT) is closely related to the presence of coronary artery disease and myocardial infarction. About 50% to 60% of those with carotid disease have serious coronary disease, while only 10% of those with coronary artery disease have serious carotid diseases.[3-7] It is not known whether there is carotid atherosclerosis in patients with hypertension without coronary atherosclerosis, that is, it is not known whether there is an increase in CIMT. Although hypertension appears to be associated with increased intima-media thickness in most studies, there are studies that did not yield the same results.[5,6,8-10] Considering that effective antihypertensive treatment prevents cardiovascular complications of hypertension, we aimed to compare carotid intima media thickness (CIMT) in patients whose blood pressure is under control with antihypertensive treatment with the normal population.

METHODS

All patients included in the study were informed about the study and informed consent forms were obtained. The study protocol was approved by the Ethics Committee of İnönü University (Date: 04.02.2009 Decision No: 242972). All procedures performed in this study were done according to the ethical standards of the 1964 Helsinki declaration.

Patients who applied to our cardiology department with chest pain and underwent elective coronary angiography between Dec 2008-2009 were randomized. In patients with normal coronary angiography results, CIMTs of 30 patients who had no additional disease and only known hypertension and were under antihypertensive treatment for at least one year were measured. Those with rheumatic heart disease, kidney failure, hypertrophic cardiomyopathy, Diabetes Mellitus, chronic liver disease, smokers, people with heart failure, people younger than 18 years and older than 75 years were excluded from the study. The blood pressures of the patients who received antihypertensive treatment during hospitalization for coronary angiography were measured every two hours, those with an arithmetic mean above 140/90 mmHg were excluded from the study. As a result, a total of 32 patients with hypertension who had no disease and whose blood pressure was

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regulated by antihypertensive therapy were included in the study. Coronary angiography was performed in all patients with 6 french right-left diagnostic cardiac catheters, using the Judkins technique, with a Philips Medical Systems Integris H 3500–5000 device. CIMT measurements were taken with a high-resolution HDI- 5000; ATL (Borhell, Washington- USA) Transthoracic Echocardiography instrument by taking advantage of the characteristic echogenicity of lumen, intima, media, adventitia surfaces in an area of 1 cm of the posterior (far) wall of the internal carotid artery (Figure 1).

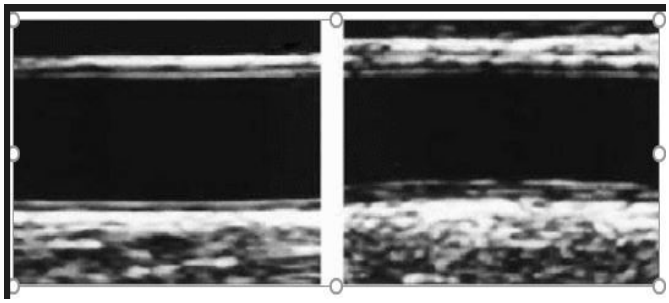

Figure 1: Ultrasonographic representation of intima-media thickness. On the left is the normal intima media thickness of the carotid artery ; on the right, the carotid artery with an increased intima-media thickness.

Statistical Analysis

Continuous variables were expressed as mean±standard deviation and categorical variables as percentage (%). Student t test was used to compare continuous variables, and Chi-square test was used to compare categorical data. A p value of <0.05 was accepted as statistical significance. Statistical analysis was performed using the SPSS statistical software (version 10.0, SPSS, Chicago, IL, USA) program.

RESULTS

In the study, 32 (16 men, 16 women) subjects without hypertension, 30 (15 men, 15 women) subjects with hypertension, who applied to İnönü University Faculty of Medicine Turgut Ozal Medical Center Cardiology Department with atypical chest pain, underwent carotid doppler in the echocardiography unit after elective coronary angiography were taken. The ages of all subjects in the study were between 18 and 75, and the mean age was 51.2±8.3 years in the hypertension group and 52.4±9.0 in the control group without hypertension. Demographic, laboratory and CIMT values of the patients are presented in Table 1.

Table 1. Laboratory values, CIMT measurements and demographic characteristics of the patients

	Hypertension group	Control group	P value
Age	51.2±8.3	52.4±9	0.664
Sex (male)	%50	%50	-
BMI	28.2±4.3	26.7±6.5	0.021
Smoker	%65	%60	0.321
Creatinine	0.71±0.18	0.66±0.23	0.211
Total Cholesterol	223±41	209±38	0.344
LDL	123±31	120±28	0.547
HDL	34±12	42±13	0.495
Triglycerides	230±105	199±85	0.197
Glucose	90±11	87±9	0.368
SBP	124±9	120±8	0.448
DBP	79±6	81±7	0.551
TSH	2.18±0.99	2.04±0.88	0.775
CIMT	5.3±1.3	5.3±1.1	0.817

BMI: Body mass index, LDL: Low density lipoprotein, HDL: High density lipoprotein, SBP: Systolic blood pressure, DBP: Diastolic blood pressure, TSH: Thyroid stimulating hormone, CIMT: Carotid intima media thickness

DISCUSSION

This study has shown us that in a group of patients who have been proven not to have coronary artery disease by angiography, the CIMT in patients whose hypertension is under control by treatment is similar compared to those in patients without hypertension. It has been proven in studies that hypertension causes subclinical atherosclerosis with end organ damage.[2,3,11] In addition, studies have shown that hypertension is associated with increased CIMT.[9,10,12] In this study, we found that there was no statistically significant difference between CIMT in patients whose blood pressure was regulated with antihypertensive treatment for more than one year compared to those in the normotensive patient group. This, in turn, suggests to us the preventive effect of effective antihypertensive therapy on the progression of atherosclerosis. In a meta-analysis by Wang et al.[8], similar to our study, they showed that the progression of the atherosclerotic process slowed down with antihypertensive treatment using CIMT measurement. One possible mechanism explaining our findings is that effective anhipertensive treatment may decrease the progression of arterial disease at the level of the carotid arteries by reducing the stress on the vascular wall could lead to structural changes.

Limitations

There are two important major limitations of the study. First, we did not evaluate the efficacy of antihypertensive therapy by measuring 24-hour ambulatory blood pressure, but instead based on blood pressure values measured at two-hour intervals during hospitalization during coronary angiography. Secondly, medial hypertrophy and atherosclerotic background cannot be distinguished in CIMT measured by ultrasound method.

CONCLUSION

As a result, no increase in CIMT was observed in patients with treatment-regulated hypertension without coronary disease when compared to healthy individuals. This makes us think that effective antihypertensive treatment slows down the atherosclerotic process.

ETHICAL DECLARATIONS

Ethics Committee Approval

The study was carried out with the permission of the Ethics Committee of İnönü University (Date: 04.02.2009 Decision No: 242972).

Informed Consent

All patients signed and free and informed consent form.

Referee Evaluation Process

Externally peer-reviewed.

Conflict of Interest Statement

The authors have no conflicts of interest to declare.

Financial Disclosure

The authors declared that this study has received no financial support.

Author Contributions

All of the authors declare that they have all participated in the design, execution, and analysis of the paper, and that they have approved the final version.

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